- Leaking brake fluid at the caliper. This can be observed by checking for evidence of fluid on the ground or deposited on the underside of the wheel fairing. Wipe the underside of the fairing with a clean, white cloth and inspect for red colored fluid residue.
- Overheated components, indicated by discoloration or warping of the disk rotor. Excessive heat can cause the caliper components to discolor or cause yellowing of the part identification label.

• NOTE •

Refer to Section 8: Handling and Servicing, "Brake Servicing" for brake system servicing information and brake overheat inspection procedures.

Cirrus Airframe Parachute System (CAPS)

The Cirrus Airframe Parachute System (CAPS) is designed to lower the aircraft and its passengers to the ground in the event of a life-threatening emergency. CAPS deployment will likely result in damage to, or loss of, the airframe, and possible injury to the aircraft occupants. Its use should not be taken lightly. Instead, possible CAPS activation scenarios should be well thought out and mentally practiced by every Cirrus pilot. Pilots who regularly conduct CAPS training and think about using CAPS will often have a higher probability of deploying CAPS when necessary.

The following discussion is meant to guide your thinking about CAPS activation. Cirrus also recommends that pilots discuss CAPS deployment scenarios with instructors as well as fellow pilots through forums such as the Cirrus Owners and Pilots Association. In the event of a spin or loss of aircraft control, immediate CAPS activation is required. (See Section 3) In other situations, CAPS activation is at the informed discretion of the pilot in command. The following discussion is intended to be informative, not directive. It is the responsibility of you, the pilot, to determine when and how the CAPS will be used. It is important to understand, however, that numerous fatalities that have occurred in Cirrus aircraft accidents likely could have been avoided if pilots had made the timely decision to deploy CAPS. It is also important to note that CAPS has been activated by pilots at speeds in excess of 180 knots on multiple occasions with successful outcomes. While the best speed to activate CAPS is below 140 knots indicated airspeed, a timely activation is most important for loss of control situations.

Deployment Scenarios

This section describes possible scenarios in which CAPS activation is appropriate. This list is not intended to be exhaustive, but merely illustrative of the type of circumstances when CAPS deployment could be the most appropriate means of saving the aircraft occupants.

Mid-Air Collision

A mid-air collision likely will render the airplane unflyable by damaging the control system or primary structure. If a mid-air collision occurs, immediately evaluate if the airplane is controllable and structurally capable of continued safe flight and landing. Unless it is apparent that structural and control system damage has not occurred, CAPS activation is recommended. If you are not sure of the condition of the aircraft following a mid-air collision, CAPS activation is recommended.

Structural Failure

Structural failure may result from many situations, such as: encountering severe gusts at speeds above the airplane's structural cruising speed, inadvertent full control movements above the airplane's maneuvering speed, or exceeding the design load factor while maneuvering. If a structural failure occurs, CAPS activation is recommended.

Loss of Control

Loss of control may result from many situations, such as: a control system failure (disconnected or jammed controls); severe wake turbulence, severe turbulence causing upset, severe airframe icing, or pilot disorientation caused by vertigo or panic. If loss of control occurs, the CAPS should be activated immediately.

• WARNING •

In the event of a spin, immediate CAPS activation is mandatory. Under no circumstances should the pilot attempt recovery from a spin other than by CAPS activation.

Landing Required in Terrain not Permitting a Safe Landing

If a forced landing on an unprepared surface is required CAPS activation is recommended unless the pilot in command concludes there is a high likelihood that a safe landing can be accomplished. If a condition requiring a forced landing occurs over rough or mountainous terrain, over water out of gliding distance to land, over widespread ground fog or at night, CAPS activation is strongly recommended. Numerous fatalities that have occurred in Cirrus aircraft accidents likely could have been avoided if pilots had made the timely decision to deploy CAPS.

While attempting to glide to an airfield to perform a power off landing, the pilot must be continuously aware of altitude and ability to successfully perform the landing. Pilot must make the determination by 2000' AGL if the landing is assured or if CAPS will be required.

Pilot Incapacitation

Pilot incapacitation may be the result of anything from a pilot's medical condition to a bird strike that injures the pilot. If incapacitation occurs and the passengers are not trained to land the aircraft, CAPS activation by the passengers is highly recommended. This scenario should be discussed with passengers prior to flight and all appropriate passengers should be briefed on CAPS operation so they could effectively deploy CAPS if required.

General Deployment Information

Deployment Speed

The maximum speed at which deployment has been demonstrated is 140 KIAS. Deployment at higher speeds could subject the parachute and aircraft to excessive loads that could result in structural failure. Once a decision has been made to deploy the CAPS, make all reasonable efforts to slow to the minimum possible airspeed. However, if time and altitude are critical, and/or ground impact is imminent, the CAPS should be activated regardless of airspeed.

Deployment Altitude

No minimum altitude for deployment has been set. This is because the actual altitude loss during a particular deployment depends upon the airplane's airspeed, altitude and attitude at deployment as well as other environmental factors. In all cases, however, the chances of a successful deployment increase with altitude. In the event of a spin, immediate CAPS activation is mandatory regardless of altitude. In other situations, the pilot in command may elect to troubleshoot a mechanical problem or attempt to descend out of icing conditions if altitude and flight conditions permit. As a data point, altitude loss from level flight deployments has been demonstrated at less than 400 feet. Deployment at such a low altitude leaves little or no time for the aircraft to stabilize under the canopy or for the cabin to be secured. A low altitude deployment increases the risk of injury or death and should be avoided. If circumstances permit, it is advisable to activate the CAPS at or above 2,000 feet AGL.

While CAPS activation above 2,000 feet is not necessarily safer than activation at 2,000 feet in terms of the altitude needed to deploy the parachute and slow the descent of the aircraft, there are other risks associated with delaying deployment. Distraction, deterioration in flight conditions, aircraft damage, pilot injury or incapacitation all could take place above 2,000 feet and prevent a timely deployment. At any altitude, once the CAPS is determined to be the only alternative available for saving the aircraft occupants, deploy the system without delay.

Deployment Attitude

The CAPS has been tested in all flap configurations at speeds ranging from V_{SO} to V_A. Most CAPS testing was accomplished from a level attitude. Deployment from a spin was also tested. From these tests it was found that as long as the parachute was introduced to the free air by the rocket, it would successfully recover the aircraft into its level descent attitude under parachute. However, it can be assumed that to minimize the chances of parachute entanglement and reduce aircraft oscillations under the parachute, the CAPS should be activated from a wings-level, upright attitude if at all possible.

Landing Considerations

After a CAPS deployment, the airplane will descend at less than 1700 feet per minute with a lateral speed equal to the velocity of the surface wind. The CAPS landing touchdown is equivalent to ground impact from a height of approximately 13 feet. While the airframe, seats, and landing gear are designed to accommodate the stress, occupants must be prepared for the landing. The overriding consideration in all CAPS deployed landings is to prepare the occupants for the touchdown in order to protect them from injury as much as possible.

Emergency Landing Body Position

The most important consideration for a touchdown with CAPS deployed is to protect the occupants from injury, especially back injury. Contacting the ground with the back offset attempting to open a door or secure items increases the likelihood of back injury. All occupants must be in the emergency landing body position well before touchdown. After touchdown, all occupants should maintain the emergency landing body position until the airplane comes to a complete stop.

The emergency landing body position is assumed with tightened seat belt and shoulder harness by placing both hands beside the legs, and holding the upper torso erect and against the seat backs. The seat cushions contain an aluminum honeycomb core designed to crush under impact to absorb downward loads and help protect the spine from compression injury.

Door Position

For most situations, it is best to leave the doors latched and use the time available to transmit emergency calls, shut down systems, and get into the Emergency Landing Body Position well before impact. The discussion below gives some specific recommendations, however, the pilot's decision will depend upon all factors, including time to impact, altitude, terrain, winds, condition of airplane, etc.

There is the possibility that one or both doors could jam at impact. If this occurs, to exit the airplane, the occupants will have to force open a partially jammed door or break through a door window using the Emergency Exit Hammer located in the lid of the center armrest. This can significantly delay the occupants from exiting the airplane.

If the pilot elects to touchdown with a door opened, there are several additional factors the pilot must consider: loss of door, possibility of head injury, or injury from an object coming through the open door.

- If a door is open prior to touchdown in a CAPS landing, the door will most likely break away from the airplane at impact.
- If the door is open and the airplane contacts the ground in a rolled condition, an occupant could be thrown forward and strike their head on the exposed door pillar. Contacting the ground in a rolled condition could be caused by terrain that is not level, contacting an obstacle such as a tree, or by transient aircraft attitude.
- With a door open, it is possible for an object such as a tree limb or flying debris to come through the opening and strike an occupant.

• WARNING •

If it is decided to unlatch a door, unlatch one door only. Opening only one door will provide for emergency egress as well as reduce risks associated with ground contact. Typically, this would be the copilot's door as this allows the other occupants to exit first after the airplane comes to rest.

Water Landings

The ability of the airplane to float after a water landing has not been tested and is unknown. However, since there is the possibility that one or both doors could jam and use of the emergency egress hammer to break out a window could take some time, the pilot may wish to consider unlatching a door prior to assuming the emergency landing body position in order to provide a ready escape path should the airplane begin to sink.

Post-Impact Fire

If there is no fire prior to touchdown and the pilot is able to shut down the engine, fuel, and electrical systems, there is less chance of a post impact fire. If the pilot suspects a fire could result from impact, unlatching a door immediately prior to assuming the emergency landing body position should be considered to assure rapid egress.

Ground Gusts

If it is known or suspected that ground gusts are present in the landing zone, there is a possibility that the parachute could drag the airplane after touchdown, especially if the terrain is flat and without obstacles. In order to ensure that the occupants can escape the airplane in the timeliest manner after the airplane comes to rest, the pilot may elect to unlatch the copilot's door for the CAPS landing. Occupants must be in the Emergency Landing Body Position for touchdown. Occupants must not loosen seat belts until the airplane comes to rest. When the airplane comes to rest, the occupants should exit the airplane and immediately move upwind to prevent a sudden gust from dragging the airplane in their direction.

CAPS Deployment

• WARNING •

The maximum demonstrated deployment speed is 140 KIAS.

1. Activation Handle Cover ..... REMOVE
2. Activation Handle (Both Hands) ..... PULL STRAIGHT DOWN

After deployment, as time permits:

3. Mixture ..... CUTOFF
4. Fuel Selector ..... OFF
5. Fuel Pump ..... OFF
6. BAT 1, BAT 2, ALT 1, and ALT 2 Switches ..... OFF

   Turn the master switches off after completing any necessary radio communications.
7. Ignition Switch ..... OFF
8. ELT ..... ON
9. Seat Belts and Harnesses ..... TIGHTEN
10. Loose Items ..... SECURE
11. Assume emergency landing body position.
12. After the airplane comes to a complete stop, evacuate quickly and move upwind.

Procedure Complete

• WARNING •

Jerking or rapidly pulling the activation T-handle will greatly increase the pull forces required to activate the rocket. Use a firm and steady pulling motion – a "chin-up" type pull ensures successful activation.

• NOTE •

The Cirrus Airframe Parachute System (CAPS) should be activated immediately in the event of a spin. It should also be used in other life threatening emergencies where CAPS deployment is determined to be safer than continued flight and landing.

Expected impact in a fully stabilized deployment is equivalent to a drop from approximately 13 feet.

(Continued on next page)

(Continued)

• CAUTION •

CAPS deployment will likely result in damage or loss to the airframe.

• NOTE •

Several possible scenarios in which the activation of the CAPS would be appropriate are discussed in Section 10: Safety Information of this Handbook. These include:

- Mid-air collision
- Structural failure
- Loss of control
- Landing in inhospitable terrain
- Pilot incapacitation

All pilots should carefully review the information on CAPS activation and deployment in Section 10 before operating the airplane.

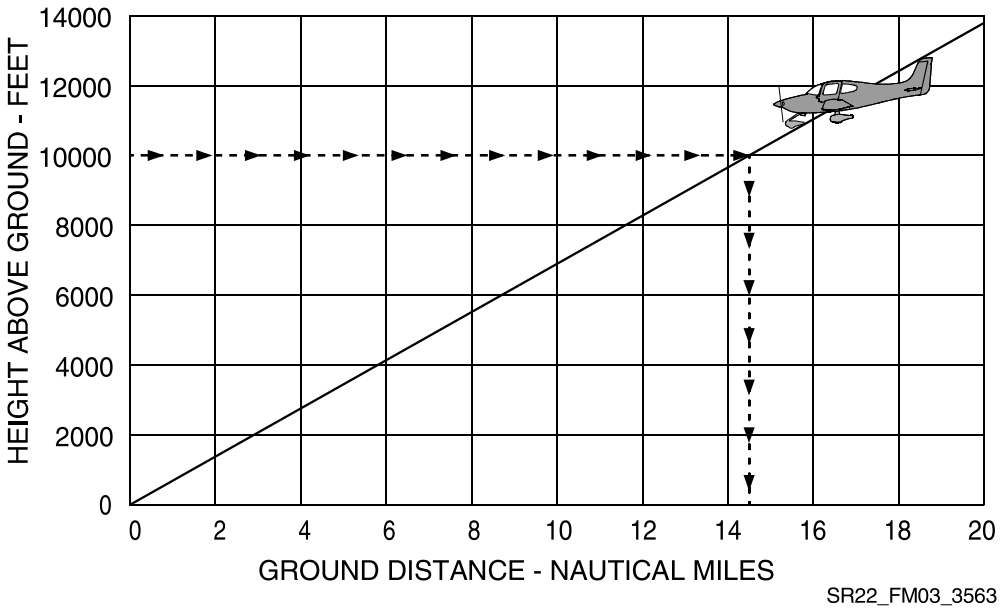
Glide

Conditions		Example	
Power	OFF	Altitude	10,000 ft. AGL
Propeller	Windmilling	Airspeed	Best Glide
Flaps	0% (UP)	Glide Distance	14.5 NM
Wind	Zero		

Best Glide Speed

3600 lb (1633 kg)..... 92 KIAS

Figure 3-1: Maximum Glide Ratio ~ 8.8 : 1



Airspeed Calibration

Normal Static Source

Conditions:

- Power for level flight or maximum continuous, whichever is less.

• NOTE •

Indicated airspeed values assume zero instrument error.

KIAS	KCAS		
	Flaps 0%	Flaps 50%	Flaps 100%
60	57	50	56
70	68	66	69
80	79	80	80
90	89	92	91
100	100	102	102
110	111	113	113
120	121	123	
130	132	133	
140	142	144	
150	152	154	
160	163		
170	173		
180	183		
190	193		
200	203		
210	213		

Stall Speeds

Conditions:

- Weight ..... 3600 LB
- CG ..... Noted
- Power ..... Idle
- Bank Angle ..... Noted

• NOTE •

Altitude loss during wings level stall may be 250 ft or more.

KIAS values may not be accurate at stall.

Bank Angle Deg	STALL SPEEDS					
	Flaps 0% Full Up		Flaps 50%		Flaps 100% Full Down	
	KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
3600 lb - Most FWD C.G.						
0	74	73	70	67	64	61
15	76	74	71	68	64	62
30	80	78	74	72	67	65
45	87	87	79	79	73	72
60	103	103	92	94	85	86
3600 lb - Most AFT C.G.						
0	72	70	69	66	63	60
15	73	71	70	67	64	61
30	77	75	73	71	66	65
45	84	83	79	78	72	72
60	99	99	91	93	85	85